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THE LINGUISTIC TYPOLOGY OF THE OLD EUROPEAN SUBSTRATA IN NORTH CENTRAL EUROPE

Martin E. Huld
California State University, Los Angeles

One of the essential features of the Kurgan hypothesis is the view that the Kurgan peoples were the bearers of Indo-European dialects into Europe at the beginning of the Bronze Age. As a testable corollary, most envision Europe as possessing pre-Indo-European languages which were displaced by later Indo-European idioms. To date, evidence for such pre-Indo-European languages as proof of this claim (and by implication proof of the Kurgan hypothesis) is given by two sets of observations: the systemic transformation of Indo-European into the individual European languages by the influence of the pre-Indo-European "substrate" and supposed records of earlier non-Indo-European languages. Unfortunately, both types of evidence can be disputed.

The first is most often challenged on the basis of circularity. Change is attributed to substrate and the change is thus offered as evidence of the existence of the substrate. Change, of course, need not be based on alien influences. Hawaiian, isolated in the Pacific on a previously uninhabited island, shows a regular transformation of Proto-Polynesian *t to /k/ which is attributable to nothing more than pressures within

the Polynesian stop inventory.[1] For substratal claims to be
valid, there must be clear proof that such a language existed and
that its features can account for the changes in the influenced
language. Such records, however, depend upon literacy, and while
we have evidence for much of the circum-Mediterranean world,[2]
Central Europe remains something of a linguistic lacuna. This
situation is significant, for Central European cultures, TRB and
Linear Ware, are among the last reasonable alternatives to the
Kurgans as progenitors of the Indo-Europeans. Therefore, the
linguistic affiliation of this region is as vital to answering
questions of Indo-European origins as are the questions of the
antecedents of Corded Ware.

Taken as a whole, I believe that a series of anomalous
culture words from the vocabulary of six linguist groups of north
Central Europe — Meillet's "Northwest" ie Italic, Celtic,
Germanic, Baltic and Slavic — along with an occasional parallel
to Balkan-Aegean forms identify loan words from the non-Indo-
European languages and that these loans may be used to identify
some linguistic traits of the region. The majority of these
words form a single set that exhibits Balkan-Aegean affinities in
such non-Indo-European features as open syllable patterns except
for diphthongs and nasal plus stop clusters which may point to
either nasalized vowels or prenasalized stops. Such words are
distributed throughout the "Northwest" group and represent
indigenous flora and technological terms. This evidence suggests
that the block of early neolithic cultures that have been called
"Painted Pottery" by some and "Old Europe" by Marija Gimbutas may
have formed a pre-Indo-European Sprachbund, a collection of

distinct, perhaps unrelated, languages, all of which share
similar phonological, morphological and syntactic patterns and
inventories.[3]

In presenting this evidence, it is important to assess the
reliability of linguistic inferences about prehistory. Certainly
the vocabulary of a reconstructed language indicates part of the
cultural concerns of its erstwhile speakers. The trick, though,
is how to separate the original vocabulary from later accretions
such as loans and innovations. Fraser (1926) doubted that
linguists had any control over their data and thus rejected the
validity of all linguistic palaeontology. Recently he has been
joined in this self-imposed blindness by Colin Renfrew (1989).
In fact, Fraser's representation of the aims and methods of
linguistic palaeontology is completely false. By the nineteenth
century, real linguistic palaeontologists knew that French
champs, Spanish *campo* and Italian *campo* meant that in French,
Latin [k] became [š] before [a]; therefore French *café* must be a
loan. Spanish *rojo* beside Italian *rufo* means that intervocalic
[f] is reflected as Spanish [x]; *cafe* must be a loan in Spanish.
Italian *amato* beside French *aimé* shows that French *-é* matches
Italian *-ato*; therefore, Italian *cafe* is also a loan. The
neogrammarian doctrine of regular sound change had solved
Fraser's conundrum a generation before he wrote. By trusting
Fraser, Renfrew remains perplexed by problems whose solutions are
commonplaces to undergraduates.

The borrowing of words is an inevitable feature of human
culture; however, the universal fact of borrowing does not lead
to a universal opaqueness of linguistic data. Loan words may be

identified by four traits. The phonemic uniqueness of all
languages means that words of foreign origin are often betrayed
by foreign sounds. English *genre* [žɑnrə] with its voiced
alveopalatal spirant, [ž], is clearly marked as a loan. In Indo-
European, the phoneme [b] points to non-Indo-European origins.
Indeed, one of the few b-initial roots in Pokorny, the set
exemplified by OIn *barbara-* and Gk βάρβαρος, signifies just that,
non-Indo-European. Proto-Indo-European words also have no
original affricates and only one spirant, a sibilant [s].

Unusual combinations of sounds also mark loans. A name like
Vroman's [vrowmənz], an important bookstore in Pasadena, contains
typical English sounds [v] and [r] but in a sequence that is very
un-English. Indo-European words do not employ sequences of
dental plus sibilant or geminates except across morpheme
boundaries. Even in these cases, they were often simplified as
in the second person singular of the verb 'be' which both Homer
(εῖ) and the Vedas *(asi)* agree was *'esi with one *s, not the
morphologically expected *{'es-si}. Thus, words that contain
either affricate reflexes or geminates that cannot be derived
from known sources or later developments should be suspected of
being pre-Indo-European loans.

Phonetic uniqueness, though, is the least useful criterion,
for foreign sounds are often adapted, thus the trill of Spanish
arroyo becomes an American approximate. It is only useful when
different adaptations coexist, a sign of former difficulties.
Thus, ON *kirkja* reflects disyllabic *kirkjōn- (in defiance of
Sievers' Law), while OE *cyrice* and OFr *sthereke* reflect an
umlauted *kurikōn-; OS *kirika* and OHG *kiricha* also reflect a

trisyllabic *kirikōn- but this time with a front vowel in the
stressed syllable. Even without the evidence of Gk κυριακόν, the
loan status of Germanic 'church' is clear because of its aberrant
root shape. The canonical Indo-European root is a monosyllable
bounded by consonants as Saussure pointed out in 1878, and
Meillet published a list of permitted and forbidden root shapes
as early as 1892.

Morphological properties also help to separate original
words from later borrowings. Productive morphemes may or may not
be old, eg -*ness* gives us no clue whether *craftiness* or
youthfulness is older; but non-productive morphemes mark old
constructions. Thus *warmth, length, or youth* are shown to be old
by the moribund suffix -th which cannot be widely added and
causes phonemic changes to many morphemes.

Words found only in a small or restricted area are likely to
be loans or later innovations. Conversely, the geographical
distribution of words which are found in widely separated areas
is the mark of an original lexical item. A feminine *strætō*
'street, paved road' is attested only in the Germanic languages
contiguous to the Rhine or its mouths — OE *stræt*, OFr *strēte*, OS
strēte, OHG *strāzza*. This fact alone excludes it from the Proto-
Germanic lexicon whether or not we consider its Latin source:
(*via*) *strāta*. On the other hand, PG *alx- 'temple' is attested
in a tesellated pattern, the northwest [OE *ealh*, OS *alah*] and
southeast [Go *alhs*] which indicates its antiquity.

The application of these four techniques enables us to
isolate about two dozen words found in some or all of Meillet's
'Northwest' languages and to sort them into two sets. A smaller

set consists of seven words narrowly confined to either Celtic or
Italic or both[4] and occasionally another language of Meillet's
Northwest Group. The literary evidence suggests that the source
was still extant in the second to fourth centuries AD and was
centered in a region north of Italy, for which reason I shall
refer to it as 'Alpine', although there is nothing to suggest
that the language was exclusively associated with mountainous
regions. The term is merely a label for forms are disyllables
with frequent medial geminates. The ambiguity of voice that the
initial stops often show suggests alien phonetics or variability
in the source. The larger set of sixteen items shows
similarities to Balkan-Aegean phonology. Again, to avoid
archaeological or ethnographic labels, I shall call this stratum
North Balkan only to suggest its similarities with the Balkan-
Aegean words known from Greek. Typical items have open syllables
except for diphthongs and clusters of nasal and stop. The former
suggests palatalization, a feature suggested by Palmer for Minoan
(1963:39). The latter point hints at either nasalized vowels or
prenasalized stops. Such words are distributed throughout the
"Northwest" group and represent a broad range of indigenous flora
and technological innovations. The greater spread of this group
suggests that these forms reflect the principal language types of
Old Europe.

Before I review the evidence for these two strata of pre-
Indo-European languages, let me add a few words of caution. The
asterisked forms which I adduce here are *not* reconstructions of
Old European in the same rigorous sense that I reconstruct Proto-
Indo-European. For one thing, Old European may not be a single

language, but a collection of mutually unintelligible (and even
unrelated) languages sharing only a common typology; also, the
collective distortions caused by adapting Old European words to
Indo-European phonetics may make exact phonetic recovery
impossible. Navaho *bilàgáanéé* and Jicarilla *bińgànií* 'English-
speaking white man' show a variation between [l] and [n] which,
though typical of many Amerind languages, is not usual for the
Apachean group to which these two belong. This feature marks a
loan as surely as the Old European features mark non-Indo-
European substrate in Europe, but I doubt that any linguist
dealing only with the Apachean data could correctly deduce the
proto-form, *Americanos* or recover much Spanish grammar.

The Alpine group contains disyllabic words with geminated
consonants or clusters. The items are largely Italic and Celtic
in distribution, but variation in the voice of the stop indicates
a phonetic structure different from Latin. Whether this
difference is because the language had initial consonant mutation
as in Celtic or because its phonetics were alien to Latin sound
cannot be determined.

The word for the heavy 'plough' indicates a technological
innovation in European agriculture. Manuscripts of Pliny record
plaumorati which has been interpreted as a scribal blunder for
plouum raeti 'Rhetic plow'. If so, this would indicate a
borrowing in the second century. Later evidence does not appear
until the seventh century, when the word is attested in late
Latin *plōvum*. The glide makes a direct borrowing from or to the
other examples, which show a voiced dorsal stop, phonetically
improbable and indicates that *plōujo- had a previous history.

PG *plōɹaz [ON plógr; OE plōɹ, plōh; OFr plōch, OHG pfluog] has a long ō which cannot, unlike Lith plūgas, whose loan-status from Slavic as shown by the varying Stosston and Schleifton accents, have been borrowed from OCS плугъ < PS *plūgŭ. Nor can the Slavic vowel, a reduction of a diphthong, be derived from Proto-Germanic. As Lynn White (1962:49) observed, the plough is one of several early mediaeval technological p-words of northern Europe for which no credible Slavic, Celtic or Germanic source is known. I suggest that the "northern peasant culture" which Bratanič (1952) identified as the source of [*plōugo-] is the Alpine language of Old Europe, evidence that non-Indo-European populations remained for some time in central Europe.

The unusual Germanic words for container, ON kanna, OE canne, OS kanna and OHG channa have been regarded by Pokorny (1959:351) as reflexes of an Indo-European root shared only by Germanic and Celtic [MIr gann], for he takes the sixth century Latin canna to be a loan from Germanic. The OED derives the Germanic words from Latin cantharus, a loan from Greek κάνθαρος. This account fails to explain the loss of the final syllable or the assimilation of the nasal and stop and is best abandoned. The geminate nasals in both Celtic and Germanic suggest an Alpine word which I represent as *[gann-].

A pre-Indo-European word for 'pig' *mokku- is attested only in Celtic [OIr mucc, W moch, Bret moc'h, and the Gaulish god Moccus]. Hamp suggested (1987:187) that a cross with IE *suH- gave *sukkos, the antecedent of Welsh hwch. In this, the word resembles the contamination seen in 'willow' and indicates the intimate contact that occurred between the Alpine language and

Indo-European. A similar origin may account for the problematic OE suɹu, whose voiced medial implies that the geminate was reinterpreted in Germanic as a single stop, subjected to Grimm's Law and then voiced by Verner's Law. If these sound changes are correct, *mokku- indicates that the Alpine language also loaned its word for pig into Germanic and at an earlier date than the spread of 'cat', a fact that agrees with the reconstructibility of the term to Proto-Celtic.

In his extensive study of Indo-European salmonid terminology, Richard Diebold suggested (1986:59 nt 13) that the isolated Lat salmō might reflect a Old European loan from western Europe. The word was first recorded in the second century by Pliny. Walde-Hofmann relate this fish to the verb salīre, but while spawning salmon do indeed leap, this explanation fails to account for the final syllable. Also, the related 'trout' salar seems akin and also has a final syllable that is inexplicable; accordingly, I take both words to reflect a second century loan from one or more Alpine languages.[5]

Celtic and Germanic also share a common word for 'horse' which competes with pan-IE equine terms such as *Eek-ɥo- and *pōl-. A proto-form *marko is assured by OIr marc, W march reflecting PCt *marko- and PG *marxo reflected by ON marr, OE mearh, OFr mar and OHG marah. Because horses are frequently named for their coats, (cf roan, bay and pinto) a relation between PIE *marko- and color terms like *morHgʷo 'dark' have been suggested. However, the latter has a laryngeal as shown by both the Lithuanian (márgas) and Albanian (ı murg) cognates. This fact excludes a relation between and *marko- 'horse' and

*morHgᵂo- and reveals that the word is isolated in Celtic and
Germanic. Although the Indo-Europeans are regarded as
instrumental in the domestication and spread of the horse,
evidence from Amerind languages show that the appearance of the
horse does not require borrowing of the word. Jicarilla is just
one language in which an original term for 'dog' [łįį'] has
become 'horse'.[6] Moreover, it is interesting to note that
reflexes of *marko are found in eastern Asia as well in the form
of Korean mal, Japanese me which Miller relates to Proto-Altaic
*marka (1971:76), suggesting that the term may be part of a later
Eurasiatic spread of equine terminology.

I finish this survey of possible Old European Alpine terms
with one for 'dwelling', Pokorny's *trab-, (1959:1090) whose [b]
and northwestern distribution make it a prime candidate. The
vocalism is also erratic. It does not conform to any of the
traditional IE ablaut patterns that might point to a thematicized
consonant-stem. In Italic Osc trifbum 'house' reflects a
lengthened grade, Lat turba 'crowd' reflects a zero-grade,
consistently maintained in Celtic [MIr treb, MW tref < PC *tr̥bā]
and common in Germanic [ON þorp, OE ðorp, OFr thorp; OS thorp;
OHG dorf, Go þaurp < PG *θurp-] although an a-grade, *θarp- is
recorded in OFr therp and OS tharp. Lat trab 'beam' with its odd
a-grade vocalism must be original, for the same vocalism appears
in Lith trobà which has lengthening of PB *trabā by Winter's Law.

The cardinal example of a non-Indo-European word in central
Europe are the terms for 'apple' and 'apple-tree', whose [b] is a
clear indication of alien phonetics. Although the form is
exclusively attested in Europe by clear reflexes in four

branches: Celtic,[7] Germanic,[8] Baltic,[9] and Slavic[10] as well as
marginal evidence in two others, the Italic toponym Abella and
problematic Balkan glosses, Thracian dinupula or sinupyla,
glossed as μήλωθρον and Dacian κινούβοιλα,[11] attempts have been
made to connect 'apple' with a vaguely similar term in
Burushaski. The form, rarely cited in such discussions, is
balte. The comparison rests on an ad hoc morphological division
which cavalierly discards the final syllable. What is left, has
to be forced into comparison by the expedient of metathesis.
When we consider the bad phonological match and geographical
discrepancy of the Hindu Kush and central Europe, between which
no trace of anything resembling either the European or Himalayan
'apple' is attested, it is wiser to seek an origin in Europe
alone. For these same reasons we must dismiss the improbable
connexion with Hitt šamalu-, recently championed via an s-mobile
by Gamkrelidze and Ivanov (1987:638)

As Hamp observed (1979), the Old Irish reflex, ubull, shows
persistent rounding of the initial vowel which cannot be
attributed to original *o, for the Baltic forms [Lith óbuolys,
Latv ábuolis, OPr woble] reflect lengthening of *a by Winter's
Law. Hamp rightly attributes the Irish vocalism to the non-Indo-
European timbre of the initial vowel. The varying timbres of the
second vowel have been ascribed to ablaut of an original
consonant stem by scholars such as Fraenkel, but this vowel may
be equally non-Indo-European, for OFr [a] of appel 'apple', like
OS appul and OHG apful must precede a back vowel, as in ON apal-
dr and OE apul-dor 'apple-tree' to prevent Anglo-Frisian
fronting; on the other hand, OE æppel with its front vowel must

precede a non-high, non-back vowel, while ON *epli* must reflect a form with a high front vowel, for which De Vries reconstructs *apalja* but Hamp prefers *apljaN*. Both reconstructions, however, with their resonantal simplex after two lights or a heavy syllable would defy Sievers' Law. Rather than a neuter ja-stem, we must have a metathesis of original *apila-. We shall see this anomalous medial vowel timbre and metathesis in other Germanic reflexes of North Balkan loan words, and it must represent a feature of the original phonetics. The persistent rounding in the Baltic and Slavic reflexes can be accounted for by assuming unmotivated differences in IE length or roundedness in a pre-IE sound. If the non-Indo-European language possessed either front rounded vowels or back unrounded vowels, Indo-European speakers may well have had difficulty in assigning the vowels to the canonical patterns of front unrounded or back rounded. Accordingly, I suggest non-Indo-European vowel timbre in both syllables, [*å-bö-lo-]. The uniform masculine and neuter point to an o-like final vowel, whose true quality, like all final syllables, has been concealed by Indo-European morphological adaptations.

In Italy, Switzerland and Austria neolithic apple caches have been found. These fruits were probably stored for winter and attest the economic importance of Pirus silvatica, the wild wood apple. As such, it is likely that 'apple' may be loaned from the pre-Indo-European language of Central Europe. This term competes with native Indo-European 'apple' *meAl-om, found in Greek and possibly Italic and Albanian in the west and Tocharian in the east. Hittite preserves the expected laryngeal, and the metaphoric extension to facial features shows its native origins. This situation is comparable to the North American Mephistis mephistis which is called by the English mustelid term, 'polecat' as well as Algonkian 'skunk'.

The botanical term Corylus avellana L. for 'hazel' preserves Old European [*ko-sü-lo-], also an economically important tree. Variation of the Latin spellings, *corylus* and *corulus* show the uncertainty over the medial vowel, but rhotacism in this term and the metathesized adjectival form *colurna* proves that a medial vowel was present at an early time and is not merely an epenthetic accretion. Celtic speakers, on the other hand, seem not to have had such a medial syllable in OIr *coll* and W *coll-en*. The loss of this syllable cannot be attributed to a medial laryngeal, which Celtic would have preserved as faithfully as Italic. In Germanic, the northern languages (ON *hasl* and *hesli* < *xaslfan-[12] and OE *hæs(e)l* show a medial front vowel, while OHG *hasal(a)* shows a medial non-front vowel, the same phonetic ambiguity as 'apple' reveals, hence a similar vowel. If the disputed Lith *kasulas* 'hunting spear' is a Baltic reflex, we have confirmation that the medial syllable cannot have been an Indo-European laryngeal but was somehow rounded. Beside these Old European terms, Alb *lajthí*, OCS *lěsko* and Lith *lazdas* point to a competing Indo-European term for 'hazel', *log-.

Because of its vague similarity to Indo-European 'alder', Old European 'alder' has been confused with *Aels-no-, an Indo-European form with typical heavy consonantism, and attested discontiguously in Hittite [GIŠ*alanza(n)-*], Baltic [Lith *alksnis*], Italic [Lat *alnus*], and Albanian [*halë*]. The

phonology, however, of the pre-Indo-European open sonorities is clearly attested in four geographically contiguous branches. A Celtic or Gothic loan appears in Spanish *aliso*, French *alise* and perhaps Basque *altza*. All show the medial vowel as front. In Germanic, ON *ólr* and OE *alor* point to a back vowel < PG *aluz-*; all other forms [ON *elri(r)*, OE *ellen* 'elder', OFr *elren*, OHG *erila*, *elira* < PG *al(i)zi-*, *alizō-* point to an umlaut-causing front vowel, the same vowel attested in Slavic олъха < PS *alisā* and Makedonian ἄλιζα ἡ λευκή τῶν δένδρων[13] found in Greek glossaries.[14] One would be tempted to reconstruct [*a-lŭ-sa], but the preference for i-timbres suggests a different medial vowel, perhaps [*a-lĭ-sa]. If this is the case, it is noteworthy that the first two words contain only 'rounded' vowels while the third has only unrounded vowels. Perhaps the pre-IE language possessed some rule of vowel harmony.

The fourth Old European tree name, 'willow' which I represent as [*sa-lək] shows the intimate nature of the Indo-European and Old European confrontation. The form is attested in three western branches. Italic [Lat *salix*] and Celtic [OIr *sail*, gen. *sailech* < *salikos*; W *helyg-en*] clearly reflect a front vowel in the medial syllable as does ON *selja* < PG *salxjan-*, again with the non-canonical reflex of Sievers' Law metathesized from *salixan-*. Other Germanic cognates require a back vowel, directly attested in OHG *salaha* and shown through phonological breaking in OE *sealh* < PG *sal(a)xo].

This borrowed term competes with Indo-European 'willow' *uoit-i- the source of Av *vaētiš*, NP *bīd*, Gk οισος [ϝιτέα, οἴσυα] (if reformed from *ϝοισις). With dissimilative loss of

rounding in the root vowel to *ueit-i we find OE *wīþiʒ*, ON *víðr* < PG *wīθiz*. Beside these terms, a third term reflected in Greek ϝελίκη and OE *wilge* < *welikā* shows conflation of Indo-European and pre-Indo-European. In central Europe the different languages must have been spoken side by side for some time. A series of similar sounding Finno-Ugric terms [Finn *salava*, Tcheres *šol*, Hung *szil*] may suggest relations between pre-Indo-European and Finno-Ugric or indicate the extent of the loan domain.

A term for 'gelding, pack-horse' in four branches, Italic [Lat *caballus*, *cabōnem* 'nag'], Slavic [OCS кобыла, 'mare' конь 'stallion'], Baltic [Lith *kumēle* 'mare'] and a Greek glossary item [καβάλλης·ἐργάτης ἵππος (Hes)] may derive from an Old European word adapted to IE equine domestication. Mayrhofer (1956-78) rejected as unfounded equations between the Greek etymon and OIn *kumāra-* 'new-born' but noted that a variety of ethnonyms have given rise to horse terms elsewhere and noted Herodotus's Καβηλέες. A series of Asian forms such as Turkish *kävär* recorded as a synonym of *at* 'horse' and Persian *kaval* show that such forms are spread beyond the borders of Meillet's "Northwest." Phonetically, however, within this region, the lateral varies with a nasal (in Latin and Slavic) and the medial stop varies with a nasal (in Baltic). Baltic and Slavic show consistent rounding of the first syllable while the second syllable is often mid. None of these changes is typical of Indo-European phonology, nor is any form found outside of north-central Europe. This situation may indicate that the forms, even if from an Asian source, were interpreted through the phonetics of North Balkan [*ka-$_{m}$bö-lo-].

A term for 'oats' is attested in three branches: Italic,
Baltic and Slavic. Latin *avēna* < *avesno-* favors a mid front
vowel while the others [Lith *avižos*, Lett *auzas* and OCS овьсъ]
show a high front vowel, a discrepency which seems to be
associated with pre-Indo-European. The consonantism is equally
aberrant.

Pokorny (1959:88) reconstructed *awig-. A cluster with a
following *s would explain the Italic and Slavic consonantism,
but would leave Baltic voicing as anomalous as before. The stop
seems largely to be posited to account for Greek αἰγίλωψ which
means both 'oat-grass' and 'Turkish oak', but there is no
evidence in the Greek records of a lost digamma. Moreover, the
morphological division calls for an ad hoc, unexplained suffix,
-λωψ. A spirant of indeterminate voicing would account for the
Italic and Balto-Slavic forms more concisely. To this group, I
would include Germanic terms. ON *hafri*, OS *haboro* and OHG *habaro*
point to a back vowel in PG *xavazan-. On the basis of these
anomalies, I would represent the form as [*χa-wə-ẓa] and note
that the word was borrowed late into Germanic for the initial
fricative is preserved, unlike Indo-European laryngeals.

Tocharian forms [*wsār* and *ysāre*], possibly glossed as
'wheat' which Douglas Q Adams derived from *Awesā-ro-* oats
(1984:396), I reject on grounds of semantics. Oats were not
human food and largely occurred as a weed in barley, hence the
shift to 'wheat' is semantically unlikely; I doubt that Indo-
European had a vocalized laryngeal in the Baltic, Slavic and
Italic forms, so the Tocharian match is phonologically weak and
the suffix is ad hoc.15 'Oats' remain confined to NW Europe and

share the same phonetics as the other North Balkan terms.

An isolated term for 'rye' , another late domesticated
cereal, is found in Italic [Lat *secale* or *sicale*] with uncertain
initial vocalism, for which reason Walde-Hofmann reject a
relation to the Latin verb *secāre* 'cut'. The term is old, first
recorded by Pliny. Alb *thekërë* has been derived from Latin
although parallels with Albanian /θ/ from Latin *s* are few and
usually it is Albanian /ł/ <ll> which is reflected as a trill in
Romance, eg *dhallë* 'sour milk' > Rum *zară*. Regardless of the
status of Albanian *thekërë*, the form must reflect a lowered short
*ĭ in the first syllable, for original *e would have given a
diphthong *je*. This vocalism is at odds with Caucasian forms
(Agulian *sekil* and Rutulian *sukul*) cited from Zohary by Polomé).
If cognate, they indicate a spread of this cereal term into the
steppes and southward. The final syllable is *e* in Latin but *ë*
reflecting *ā in Albanian, hence I reconstruct [*si-ka-Ræ-]. The
Latin term shows a preference for open sonority and [l], and I
include it among the Old European items.

The neolithic inhabitants of Europe may be expected to have
known of pharmacologically active plants and three deserve our
attention. North Balkan *[kæ-mə-ra-] represents a type of
poisonous plant. In Europe all of the referents apply to plants
with showy spikes of flowers whose poison is chiefly utilized in
the dark root, and all are members of the family Ranunculaceae.
OHG *hemera* < *xamirō 'hellebore' reflects a non-front first
vowel and a medial i while R *čemerica* 'hellebore' < RCSl *čemerĭ
'poison' reflects mid front vowels in both syllables, a pattern
also seen in Lith *kemēras* 'Alpkraut, Wasserdost'. Greek κάμαρος,

κάμμαρον refer to the deadly 'aconite' or medicinal
'larkspur'and agree with Germanic on the first vowel but show no
signs of the medial [i]. For these reasons, I reconstruct *[kæ-
mə-ra-] with final a to reflect the persistant ā-feminine.
Pokorny (1959:558) included the Indic terms kamala– 'Lotus' and
camarika– 'Bauhinia variegata' here, but the referents are more
benign and do not have the floral spike of the European terms;
consequently, they should not be included in this group.
Mayrhofer decalred "unwahrscheinheit ist daher die trasditionelle
Verbindung mit ahd. hemera ..." but noted a possible derivation
from Dravidian forms, citing Kan. kōmaḷe. Fraenkel (1962-64)
related the Lithuanian forms to kiemenà, but I doubt that this is
correct. All of the other forms show evidence of a simple
monophthong, but Lith ie points to an original i-diphthong;
moreover, the r-n variation would imply I-E morphophonemics with
e/o ablaut, which the Germanic *ir forms contradict. Clearly,
the phonetics are those of a North Balkan word.

Like the terms for 'pack-horse', 'hemp', first mentioned in
Greek by Herodotus, has oriental associations. The geminate
nasal and b point to a non-Indo-European source. A Finno-Ugric
origin from Cheremis keńe 'hemp' and Wotjak piš 'nettle'has been
suggested by Schrader. The same Cheremiss keńe is thought to
underly Indic śaṇá– and Ossetic san, but the geminate nasal of
the European representation [*ka-nna-bi-] recorded in Greek is
hard to account for from these as the direct source. Albanian
kërp points to a proto-form *kánapas, which like Baltic and
Slavic has a voiceless medial stop, Lith kanãpe and OCS конопля
both reflect the same proto-form, *kanap-jā. Like Albanian,

Baltic and Slavic, the medial vowels of Germanic [ON hampr OS
hanap, OHG hanaf < PG *xanapaz] reflect true vowels, not
laryngeals in a form borrowed early enough to undergo Grimm's
Law. OE hænep with its umlauted vowel, though, agrees with the
Greek i-stem, and the voiceless stop of the central European
languages is a variance with either the Greek forms or the
Germanic, which must reflect an original non-Indo-European voiced
stop, remodeled to a more common voiceless stop in Albanian,
Baltic and Slavic. An ultimate Finno-Ugric orgin is probable,
but the many phonetic shufflings, notably the voicing in Greek
and pre-Germanic appear to require an intermediate language whose
voicing properties were alien to Indo-European, and I reconstruct
[*kan-na-bï-].

Terms for 'woad', an important dye-stuff, show a Latin
cluster of [tr] in vitrum beside Germanic [ð] < [t] by Verner's
Law in OE wād, OFs wēd, and OHG weit < PG *waið-an/z, except for
a Gothic diminutive, *wizdila which can be reconstructed on the
basis of Romance spellings [uuisdil(e), ousdelem, and guisdil].
Finally, Greek ἰσάτις shows secondary [s], the result of an
earlier affricate, [č], whose alveopalatal retroflexion might
explain the odd rhotic forms of Latin. Frisk characterizes, the
Greek form as a loanword "aus einer gemeinsamen unbekannten
Quelle." The areal distribution points to Central Europe where,
despite the problems with the initial syllable, perhaps
reflecting an original diphthong, I represent the original as
[*wəi-ča-].

Among technological loans, garments are represented by two
terms. Pokorny (1959:556-57) and Buck (1949:6.44.1) associate

'shirt' with the PIE root *kem- 'cover' comparing Skt śāmulya-,
but the spirantal suffix in Lat camīsia, Ir caimmse, and W hefis
'woman's robe', and Proto-Germanic *xamiθi [OE hemeþe, OS
hemithe, OHG hemidi] is unexplained. Germanic has [h] showing a
borrowing before Grimm's Law, but [θ] points to [t] not the [s]
of Italic and Celtic. Accordingly, I suspect a less retroflected
Old European affricate, *[ka-mi-ca-], although confusion with the
Indo-European root may have arisen by folk-etymology.

    The [b] indicates 'cloak', [*bai-ta] is an alien loan.
Except for the disagreement of accent, Proto-Germanic *paiðō [OE
pād, OS pēda, OHG pheit, OBav pfeit, Go paida] matches Greek
βαίτη. Albanian pet-kë < PAlb *pait+kā has been labeled a Gothic
loan, but Gothic d represents a voiced spirant, [ð], which in
Latin loans of the same era is lost intervocalically. I suspect
that Albanian has independently borrowed the same North Balkan
item.

    Among agricultural implements a 'hoe' [*mat-tu-ka] is
attested in at least three branches: Italic [VLat matteūca > Fr
massue 'club'], Celtic [W matog], and Slavic [SC мотика, R
мотыка]. Germanic is represented only by [OE mattoc, meottuc]
whose voiceless stop defies Grimm's Law and marks it as a later
loan. Similarly, Lith matíkas, the sole Baltic example has been
claimed as a loan from Polish motyka. If so, the loan must be
very early before PIE *o > PBt a, PSl o. Shevelov puts the
change of *ū to [y] in the 8-9th c AD; typically Lith has ui for
y. Thus, there are chronological difficulties with viewing the
Lithuanian word as a loan from Polish. Pokorny (1959:700) and
Buck (1949.8.25.4) associate this word with OIn matyá- 'mace',

but this view cannot explain the gemination, the unusual second
vowel or the semantic shift to an excavating tool and is best
excluded from the discussion. In this term, we have most of the
features of the substrate — open sonorities, gemination of
stops, obscure vocalism, and a consistent isolation in North
Central Europe.[16]

    Terms for metals and their products are notorious as loans.
One such case is 'axe' which is the typical means of trade in
metals. The peculiar vocalism preserved in Germanic reflexes
points to [*a-gï-si- or a-gü-si], which I represent with the
vowel [ï] to account for the u-vowel of ON øx, OS acus, and OHG
acchus, beside the front, but non-umlauting vowel of OE æx, æces,
OHG akis and Go aqizi. Frisk labels Gk ἀξίνη, which, however,
shows no evidence of the labiovelar indicated by Gothic "verwandt
aber in einzelnen unklar." Lat ascia shows metathesis or other
deformations. Like 'axe', Latin sagitta, 'arrow' of unknown
origin, points to open sonorities [*sa-git-ta] which match the
Old European phonological features. A relation to Lat saxum
'stone' is morphologically dubious. The presence of this loan
indicates something of the cultural and technological ties
between Old Europe and the Indo-European world.

    Ipsen claimed Akk ṣarpu 'refined' as the source of western
words for 'silver' [*si-löβ-ro-], a word attested in three
branches: Germanic, Baltic and Slavic. A back medial vowel is
recorded by OE siolufr, OS siluƀar, Go silubr and CGo siluir <
PG *siluƀraz. ON silfr, OFr selver and OHG silabar point to an
unrounded medial vowel of a central character also seen in Lith
sidãbras and OPr siraplis. OCS съребро shows a front vowel,

indicating the typical North Balkan ambiguity of vocalism.[17] Ipsen's Semitic claims fail because no clear association with the Near East can be cited. The Akaddian form is not even the word for 'silver', which is *kaṣpu*. A relation to Greek [σιδηρός 'iron'] is hazardous because of the semantics, while *Basque* [zidar, zillar] 'silver' matches more closely and points to a purely European source which must have survived until quite late, for silver is not known in the Baltic regions until the second century AD. Given the rich metallurgical resources of prehistoric central Europe, a continuing pre-Indo-European tradition of metallurgical terminology is quite understandable.

Just as the "Painted Pottery Cultures" of Old Europe possessed a number of cultural traits evident to the archaeologist — advanced ceramic technology, a complex 'palace' economy for the redistribution of stored agricultural produce as shown by the huge pithoi at Knossos as well as Vinča, and a stable cultural setting shown by populous townships and accumulated tell deposits — so these cultures must have possessed a number of shared linguistic traits, a Sprachbund, evident from linguistic analysis. From the evidence that I have presented above, the pre-Indo-European languages of Old Europe fell into at least two typological groups. The first set was more westerly in its location and of less cultural importance. All of the terms are borrowed by Italic or Celtic and only one of the six extends beyond Meillet's "Northwest." Three refer to animals two to inventions and one to a house-type perhaps peculiar to the wetter climate of the region. The second, more important stratum is confined to North Central Europe but appears

to be an extension of a widespread type also found in the Aegean and Anatolia. Like the Aegean substrate, this North Balkan type was characterized by open syllables, either prenasalized stops or nasalized vowels, complex vowel timbres, possibly with rules of vowel harmony, a lower functional load for the liquids and the presence of affricates. This stratum gave a total of 16 words to Indo-European languages of North Central Europe. The greater number of them were ecological terms (one animal, four trees and five economically useful wild plants) and technological innovations (two garments, three tools or weapons and one precious metal). It would appear that the languages of this type were the dominant type in pre-Indo-European Europe. It is possible that further investigation will reveal more evidence, but I hope that I have at least shown the possibility of envisioning what pre-Indo-European was like.

Appendix:Rosters of Substrate Loans in North Central Europe

[the phonetics of the "reconstructed" words are only
approximate and deserve further research. The labels P, S, F and
B refer to works and studies by Pokorny (1959), Schrader (1917),
Friedrich (1970) and Buck (1949)]

Set I. North Balkan Substrate Words

A. Flora and Fauna terms

1. 'apple' [*å-bö-lo-]

Italic   [toponym Abella]

Celtic   [Gall Avallo- (pn); OIr ubull, MIr aball NIr ubhull; W
           afall-en],

Germanic   [ON epli < *apaljan-; apal-grár < *apal-; OE æppel <
           *apel-, apul-dor < *apol-; OFr appel < *apol-; OS appul;
           Dut appel; OHG apful; CGo apel]

Baltic   [Lith óbuolys, Latv åbuolis, OPr woble],

Slavic   [OCS яблъ-ко, яблôнъ]

2. 'hazel' [*ko-sü-lo-] P 616; S 335-36; F 73-77

Italic   [corylus, corulus < *cozVlos],

Celtic   [OIr coll, W coll-en],

Germanic   [ON hasl; hesli, OE hæs(e)l, MDu hasel OHG hasal(a)

Baltic   [Lith kasulas 'hunting spear']

3. 'alder' [*a-lï-sa] P 302-03; S 199; F 70-73

Celtic   [Sp aliso, Fr alise and perhaps Basque altza < Celtic
           (or Gothic)]

Germanic   [ON ölr, OE alor; ON elri(r) OE ellen 'elder', OFr
           elren, OHG erila, elira < PG *aluz-, *al(i)zi-, *alizō-]

Slavic   [ольха] < PS *alisā

Makedonian ἄλιζα ἡ λευκή τῶν δένδρων;

4. 'willow' [*sa-lə-kV] P 879; S 940; F 53-55

Italic   [Lat salix],

Celtic   [OIr sail, G sailech < *salikos; W helyg-en],

Germanic   [ON selja < PG salxjon, OE sealh, OHG salaha < PG
           *sal(a)xo,]

5. 'pack-horse, gelding' [*kå-ᵐbö-l-] B 3.42.3

Italic   [Lat caballus cabōnem 'nag']

Baltic   [Lith kumēle 'mare']

Slavic   [OCS кобыла, конь 'mare']

Greek   [καβάλλης·ἐργάτης ἵππος (Hes)]

6. 'oats' [*χa-wə-źa] P 88; B 8.46.2

Italic   [Lat avēna < *avesno-]

Germanic   [ON hafri < *xavzōn-, > NE haver, OS haboro, Du haver,
           OHG habaro, NHG (<LG) Hafer < *xavazō]

Baltic   [Lith avižos, Lett auzas,]

Slavic   [OCS овьсъ]

7. 'rye' [*si-ka-Ræ-] B 8.45.2

Italic   [Lat secale/sicale]

Alb   [thekërë] ? loan from Latin

8. 'type of poisonous plant' *[kæ-mə-ra-] P 558

Germanic [OHG hemera < *xamirō 'hellebore'

Baltic   [Lith kemerai 'Alpkraut, Wasserdost'

Slavic   [R čemerica 'hellebore' < RCSl čemerĭ 'poison'

Greek   [κάμαρος, κάμμαρον 'aconite'

9. 'hemp' [*ka-nna-bi-] S 330-32;

Italic   [Lat cannabis < Greek]

Germanic [ON hampr OE hænep OS hanap, OHG hanaf < PG *xanabaz]

Baltic   [Lith kanäpe < PB *kanapjā]

Slavic   [OCS конопля < PS *kanapjā]

Alb   [kërp < *kánabas]

Greek   [κάνναβις]

10. 'woad' [*wəi-čə-] S 932

Italic   [Lat vitrum

Germanic [OE wād OFs wēd, Dt weede, OHG weit < PG *waið-on/z; Go

          *wizdila < uuisdil(e), ousdelem, guisdil]

Greek   [ἰσάτις]

B. Technology (garments, construction, implements)

11. 'shirt' [*ka-mi-co] P 556-57; B 6.44.1*

Italic   [Lat camĭsia]

Celtic   [Ir caimmse ?< Lat]

Germanic [OE hemeþe, OS hemithe, OHG hemidi < PG* xamiθi]

12. 'cloak' [*bai-ta] P 92-93; B 6.43.4

Germanic [OE pād, OS pēda, OHG pheit, OBav pfeit, Go paida < PG

          *paiðō]

Albanian [pet-kë < PAlb *paitā +kā] ? Go loan; but Go d [ð]

          presents a problem.

Greek [βαίτη]

13. 'hoe' [*mat-tu-ka] P 700; B 8.25.4

Italic   [VLat matteūca > Fr massue 'club']

Celtic   [W matog]

Germanic [OE mattoc, meottuc]

Baltic   [Lith matikas]

Slavic   [SC мòтика, R мотыка]

14. 'axe' [*a-gï-si-/a-gü-si] P 9; B 9.25.1*

Italic   [Lat ascia]

Germanic [ON øx, OE æx, æces OS acus, OHG acchus, akis, Go aqizi]

Greek   [ἀξίνη]

15. 'arrow' [*sa-gi-tta]

Italic   [Lat sagitta]

16. 'silver' [*si-lo-βrV-] B 9.65.2

Germanic [ON silfr, OE siolufr, OFr selver, OS silubar, OHG

          silabar, Go silubr, CGo siluir < PG *siluβraz]

Baltic   [Lith sidãbras, OPr siraplis]

Slavic   [OCS сьребро]

?**Greek**   [σιδηρός 'iron']

Basque   [zidar, zillar]

Set I   Disyllabic words with geminated consonants or clusters, largely Italic and Celtic in distribution.

17. 'cat' [*g/katto-] B 3.62.3

Italic   [Lat g/cattus]

Celtic   [Ir cat, W câth]

Germanic [ON köttr, OE catt(e), OFr katt, OHG kazza < PG * kattō]

Greek   [γ/κάττα]

Baltic   [kate]

Slavic   [OCS котъка < *kato-kā]

18. 'pig' [*mokku-] B 3.35.5

Celtic   [OIr mucc, W moch, Bre moc'h, Gl god Moccus]

19. 'salmon' [sålmo]

Italic   [Lat salmō]

20. 'container' [g/kanT-] P 351

Celtic   [MIr gann]

Germanic [Ice kanna, OE canne, OHG channa]

Greek   [κάνθαρος]

21. 'plough' [*plōugo-] P 836; S 2.186; B 8.21.5

Italic   [M Lat plōvum]

Germanic [ON plógr; OE plōʒ, plōh; OFr plōch, OHG pfluog < PG *plōʒaz]

Baltic   [Lith plugas]

Slavic   [OCS плугъ < PS *plūgŭ]

22. 'dwelling' [*trab-] P 1090; B 9.51.2

Italic   [Lat trab 'beam', turba 'crowd'; Osc tríibum 'house']

Celtic   [MIr treb, MW tref < PC *tṛbā]

Germanic [ON þorp, OE ðorp, OFr therp, thorp; OS tharp, thorp; OHG dorf, Go þaurp < PG *θurp-, θarp-]

Baltic   [Lith trobà < PB *trabā]

NOTES

[1]Another case is Icelandic, for which there is also no conceivable substrate, but which shows systemic diphthongization of original long low vowels, æ [ǣ] and á [ā], [ai] and [au] in modern times.

[2]In Anatolia, there is Hurrian, perhaps imported from the Zagros, where its relative, Urartean, is recorded, and Hattic, whose use of prefixes to mark plurals and personal pronoun of noun stems is very un-IE in appearance. In the Aegean, Linear A is presumed to record a non-Greek language, which is supported by native tradition and later alphabetic inscriptions at Dreros and Phraisos. The Cypriot syllabary, presumably derived from the Cypro-Minoan script of the Bronze Age, records both Greek dialect and a non-Greek language. In Italy, Etruscan (and perhaps Picene and to the north Raetic should be added though they have been claimed as IE) records a non-IE language of the Iron Age. In Spain, at a slightly later date, Iberian and Taressian are to all appearances non-IE as well. In the British Isles, Pictish, much of which appears to be non-IE, survived until the close of the Dark Ages and is recorded by Christian writers and in Ogham inscriptions of notorious unreliability. Unless we deny this evidence, it is hard to accept Renfrew's 1989 thesis that the IE languages spread with the neolithic for we have more than a half a dozen non-IE languages that have participated in the neolithic revolution. If Renfrew's admirers are put off by the notion of one ethnic incursion to explain the IE presence in Europe, they must surely cringe at the need for six or more incursions to explain away the pre-IE populations.

[3]Words bridging Greece, Asia Minor and India show open sonority, two full vowels in the root and often show interchange of stop and fricative reflexes that point to original affricates, 'axe' OIn *paraśu*-Gk πέλεκυς Akk *pillaqu* while native Indo-European words have characteristic shapes and distributions eg, PIE *Aei(E)-es- 'Cu' is found in Germanic, Italic and Indo-Iranian, widely separated stocks. Morphologically, it is an s-stem neuter which is never productive. The elements are Indo-European and the root Aei(E)- obscure.

[4]This set may be related to a number of Germanic items identified by Professor Polomé in his valuable paper "Indo-European and Substrate languages in the West" which he kindly furnished to me in a pre-publication draft and an earlier paper, "The Non-Indo-European Component of the Germanic Lexicon". Since I am chiefly interested here in identifying grammatical properties of the substrate languages rather than their lexicon, I have decided to defer collating our researches until a later occasion.

[5]Here one might include PG *ǣlaz 'eel' which Professor Polomé has shown really has no acceptable etymology. Unfortunately, such an expansion would would weaken our control of the Alpine data, for unlike the North Balkan terms these are far less distinctive phonologically. As a result, I shall defer such expansion until more is known about this, the most problematic of the pre-IE strata.

[6]In Polynesia 'pig' was similarly redefined.

[7]Gaulish place-name *Avallo-*; OIr *ubull*, MIr *aball*, NIr *ubhull*; and W *afall-en*.

[8]Typical cognates are ON *epli* 'apple' < *apalja̯-*; *apal-grár* 'apple tree' < *apal-*; OE *æppel* ' apple' < *apel-*, *apul-dor* 'apple tree' < *apol-*; OFr *appel* < *apol-*; OS *appul*; Dut *appel*; OHG *apful*; and CGo *apel* all 'apple'.

[9]Lith *óbuolys*, Latv *âbuolis*, and OPr *woble*

[10]eg. OCS яблъ-ко, яблóнъ 'apple, apple-tree'.

[11]If akin to Albanian, the forms may mean something like 'dog-apple', and the reddish fruit of some forms of bryony make this a plausible interpretation, but there remain grave problems with the development of the initial stop.

[12]Again, the German **ja*-stem defies Sievers' Law. Metathesis from **xasilan-* is again a possible explanation; but if these were part of native IE phonetics, why would only these botanical terms be subjected to such a process?

[13]The meaning of this gloss must surely be 'the white [one] among tress' ie 'poplar' and not 'leprosy of trees' as Katačić (1976) interprets it.

[14]Frisk remarked that the ending of this word placed it with other substrate words like κόνυζα.

[15]As a guess, it is possible that the Tocharian forms reflect PIE *y̌esaro-*, that is, the old word for 'spring', a reference to a seasonal variety of wheat.

[16]This word, however, if properly reconstructed, doesn't adhere to the vowel harmony rule suggested earlier. Perhaps in such a late word, the rule was breaking down, or I may have misread the vowels.

[17]This word also fails to keep to the vowel harmony rule, [*si-liβ-rə-] might answer, but I hestitate to take such drastic liberties with so fragile data as these.

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